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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,294	03/12/2004	William H. Velke		5190

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CANADA

EXAMINER
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COCKS, JOSIAH C

ART UNIT	PAPER NUMBER
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3749

DATE MAILED: 10/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/798,294

Applicant(s)

VELKE, WILLIAM H.

Examiner

Josiah Cocks

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 127-147 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 127-147 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Response to Amendment***

1. Receipt of applicant's amendment filed 7/10/2006 is acknowledged. By this amendment applicant has indicated claims 1 through 126 to be cancelled. The examiner notes that claims 106-126 that were presented in the Non-compliant amendment filed 3/14/2006 were never examined. However, claims 106-126 are now marked cancelled by applicant. Accordingly, claims 127 through 147 are currently pending for examination.

***Claim Rejections - 35 USC § 112***

2. As noted in the prior Office actions, during prosecution applicant amended the claims to expressly recite that the type of fuel employed in the burner assembly is a fluid mixture of "suspended coal dust" or "coal dust slurry." These types of fuel were not explicitly recited in the application as originally filed. Accordingly, a 35 USC § 112, first paragraph rejection based on new matter was made to the claims reciting the specific type of fuel. In the response filed 12/5/2005, applicant has pointed out that the application as originally filed did include disclosure that the type of fuel may be a "conventional fluid hydrocarbon fuel" (see specification, p. 9). Further, in the response filed 7/10/2006, applicant has presented evidence in the form of art citations and dictionary definitions in support of the assertion that both applicant was aware and a person of ordinary skill in the art would have been aware that the recitation of "conventional fluid hydrocarbon fuel" includes "suspended coal dust" or a "coal dust slurry" (see pages 8-12 of the 7/10/2006 response).

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As noted in MPEP 2163.07 (I), the “mere inclusion of dictionary or art definitions known at the time of filing an application would not be considered new matter.” Therefore, based on the evidence submitted by applicant, the recitations of “suspended coal dust” and “coal dust slurry” though not expressly stated in the application as originally filed were supported by the original description through the use of the phrase “conventional fluid hydrocarbon fuel.” **Accordingly, the previous new matter rejection that was applied to the added use of these terms in the claims is withdrawn.**

#### ***Double Patenting***

3. The prior Double Patenting rejections of the claims on the basis of application 10/798,292 are withdrawn, as application 10/798,292 is no longer co-pending (abandonment date 9/15/2006).

#### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 127, 128 132, 133, 136, 137, 139-142, 144, 145, and 147 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 3,720,057 to Arenson (“Arenson”).

Arenson discloses in Figures 1-4 the invention described in applicant’s claims 127, 128 132, 133, 136, 137, 139-142, 144, 145, and 147. In particular, in Figure 3 Arenson shows an

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embodiment of a process and device where a first exchanger assembly (116) extends through a first heat transfer zone related to the combustion mechanism and a second heat exchanger assembly (126) extending through a second heat transfer zone of the combustion mechanism. The fuel supplied through conduit (120) is heated at exchanger (116), which is heated by exhaust gases from the exhaust gas vent area of a combustion mechanism that forms part of combustion turbine engine (112 or 28) conveyed through line (114). Air is conveyed through conduit (128) to the second heat exchanger (126).

In regard to applicant's recitation of specific temperature ranges --heating of the fuel to 225 degrees Fahrenheit and the fuel's auto ignition level-- and cooling the air to a level of between 38 degrees and minus 40 degrees Fahrenheit--, the general conditions of this heating and cooling are considered taught in Arenson. In particular, Arenson clearly provides that the cryogenic fluid stream (disclosed to be a liquid fuel for combustion in a turbine, see supra) is desirably heated (see col. 3, lines 48-52) and the air is desirably cooled (see col. 3, lines 64 through col. 4, lines 3). Further, Arenson provides specific examples of temperatures of the heating and cooling, such as:

- Example 1 (beginning in column 10), which shows that liquid natural gas is heated in the same manner proposed by applicant in order to leave heat exchanger (32) at a temperature of -10 degrees F (see col. 11, lines 4-19) and that air is cooled in the same manner proposed by applicant in order to leave heat exchanger (38) at a temperature of 40 degrees F (see col. 11, line 30); and
- Example 2 (beginning in column 12), which shows that liquid natural gas is heated in the same manner proposed by applicant in order to leave heat

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exchanger (116) at a temperature of 168 degrees F (see col. 12, line 49) and that air is cooled in the same manner proposed by applicant in order to leave heat exchanger (126) at a temperature of 40 degrees F (see col. 12, line 32).

Arenson does not expressly disclose temperature points within the temperature ranges now claimed by applicant. However, it has been held that for a result effective variable "where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." See MPEP 2144.05(II)(A and B). In the present case, as Arenson has clearly provided the fuel heating and air cooling are desirable (see col. 3, line 47 through col. 4, line 3) and are result effective variables (note Examples above). Accordingly, to have optimized the heating and cooling temperatures would be matter of merely optimizing the temperatures achieved through routine experimentation, and does not serve to patentably distinguish applicant's invention.

Further, as the examiner considers that the process described in Arenson in heating fuel and cooling air in a combustion process is identical to that of applicant's invention, any change in the fuel mass to combustion air mass, that occurs through this heating and cooling would also occur in the process of Arenson.

In regard to claims 135 and 145, Arenson teaches that the heated cryogenic fluid/liquid natural gas is the fuel source for operation of the turbine engine (112 or 28, e.g. see col. 1, lines 48-50 and col. 6, lines 65-68). Liquid natural gas is distinguished from natural gas (see col. 1, lines 26-29) and is considered to constitute a liquid fuel and a fuel other than natural gas or propane gas.

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6. Claims 131 and 143 is rejected under 35 U.S.C. 103(a) as obvious over U.S. Patent No. 3,720,057 to Arenson ("Arenson") with reference to U.S. Patent No. 3,224,194 to De Feo et al. ("De Feo") cited as evidence of inherency.

Arenson expressly discloses substantially all the limitations of claims 131 and 143 (note discussion above as to the disclosure of the Arenson reference). However, in regard to claims 131 and 143, this claim specifies that the combustion products produced by the combustion mechanism operate a single or dual cycle turbine system. Arenson clearly shows that a combustion mechanism that is a conventional gas turbine engine (see col. 3, lines 31-35). It has been held that a rejection under 35 U.S.C. 102 based on multiple references is proper where the extra references are used for showing that a characteristic not disclosed is inherent. See MPEP 2131. In the present case, it is inherent in the disclosure of a conventional gas turbine engine of Arenson that such an engine would necessarily include a combustion area for burning fuel and air to produce combustion products, which are then used to operate a single cycle or dual cycle turbine system. Reference is made to De Feo, which clearly shows that a conventional turbine gas engine includes a combustion area (16) that produces combustion products that drive a turbine (21) of a single cycle turbine system. Accordingly, applicant's claims 131 and 143 are not considered to read over the recitation of the gas turbine engine in Arenson.

7. Claims 129, 130, 138, and 139 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 3,720,057 to Arenson ("Arenson") in view of U.S. Patent No. 5,888,060 to Velke ("Velke")

Arenson discloses substantially all the limitations of claims 129, 130, 138, and 139 (note the discussion above of the disclosure and teachings of Arenson) with the exception of one of the heat transfer zones being related to the combustion area of the combustion mechanism, and possibly that at least one of the heat transfer zones is operated from a source other than the combustion or exhaust gas vent area of the combustion mechanism.

Velke teaches a device for pre-heating fluid to decrease its density and thus increase efficiency in a combustion system that is considered analogous prior art to applicant's invention and Arenson. In Velke, a heat storage material forms part of a heat exchanger assembly (see col. 4, lines 18-23) for the purpose of equalizing heat transfer from the heating zone to the heat exchanger during on/off cycles of the appliance. Velke also teaches the use of insulating material (21) in the heat exchanger shown in Figure 4 for the purpose of protecting against external heat loss. Velke further teaches the use of a heat transfer zone being related to the combustion area of the combustion mechanism for the purpose of increasing efficiency of the appliance (see the abstract). The fuel employed is natural gas, propane gas, or other conventional fluid hydrocarbon fuel (see col. 3, lines 64-65).

In regard to claims 130 and 139, it is not entirely clear from Arenson what source is used to operate the heat exchanger (e.g. 126). However, Velke clearly teaches that an heat transfer zone is operated from a source other than the combustion or exhaust gas vent area of the combustion mechanism in the cases where access to these heat source location is difficult (see col. 4, lines 16-18).

Therefore, in regard to claims 129, 130, 138, and 139, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the device of



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Arenson: to incorporate the heat transfer zone being operated from a source other than the combustion or exhaust gas vent area of the combustion mechanism as taught in Velke in the case that such heat source location is difficult to reach (see Velke, col. 4, lines 16-18); and to incorporate heat transfer zone being related to the combustion area of the combustion mechanism as taught by Velke for the purpose of increasing the efficiency of the appliance (see abstract).

8. Claims 134 and 146 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 3,720,057 to Arenson ("Arenson") in view of U.S. Patent No. 2,986,456 to Toulmin ("Toulmin").

Arenson discloses all substantially all the limitations of claims 134 and 146 (note the discussion above of the disclosure and teachings of Arenson) except that the liquid hydrocarbon fuel is a suspended coal dust or a coal dust slurry.

Toulmin teaches a liquid hydrocarbon fuel for combustion devices that is in the same field of endeavor as that of applicant's invention and of Arenson. In Toulmin, it is well understood that a liquid hydrocarbon fuel used, for instance in gas turbines (see col. 1, lines 24) includes powdered coal (i.e. coal dust) as such fuel burns easily, produces ultra high temperatures and high velocity gases, and provides the maximum extraction of B.t.u.s from the burning of the fuel (see col. 1, lines 16-20 and col. 2, lines 24-34).

Therefore, in regard to 134 and 146, it would have been obvious to a person of ordinary skill in the art at the time the invention was made would modify the liquid hydrocarbon fuel of Arenson to incorporate the coal dust disclosed in Toulmin for the fuel's desirable qualities in burning easily, producing ultra high temperatures and high velocity gases, and providing the

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maximum extraction of B.t.u.s from the burning of the fuel (see Toulmin, col. 1, lines 16-20 and col. 2, lines 24-34).

### *Response to Arguments*

9. Applicant's arguments filed 7/10/06 have been carefully considered but are not found persuasive.

In regard to applicant's argument appearing on pages 22-24 of the response as to an assertion that if rejection of applicant's claims are maintained, then reexamination should occur for several listed patents, this argument is not persuasive. This Office action is prepared solely on the basis of those claims presented by applicant for examination.

### **Regarding Prior Art**

Applicant has again argued that as the prior art references do not claim the invention as recited in applicant's claims, applicant's claims should be considered patentably distinct. However, an assertion that references do not **claim** the same invention as applicant is irrelevant. The relevant consideration is what these references **disclose or describe** to a person of ordinary skill in the art. What these references disclose or describe is that appearing in the patent as a whole and not merely what these references are claiming (note the statutory language identified above for 35 USC 102 and 103). As noted above, the examiner has identified both method steps and structure present in the prior art, upon which applicant's claims read.

Applicant also argues that applicant's invention is distinct from Arenson because Arenson describes use of a cryogenic fluid as the fuel source. However, as made clear in Arenson, (for example, see example 2, column 12) Arenson expressly provides that the

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cryogenic fluid used is a liquefied natural gas (i.e. a fluid fuel) that is heated by a heat exchanger (116) in the same manner proposed by applicant and that combustion air is also passed through a second heat exchanger (126) and undergoes cooling (see at least Arenson, col. 3 line 48 through col. 4, line 3). Further, Arenson clearly provides that the liquid natural gas, once it is heated, is supplied to a turbine engine for combustion within the process (see Arenson, 112 or 28, col. 1, lines 48-50 and col. 6, lines 65-68). Arenson is clearly concerned with a fluid hydrocarbon fuel and combustion air that is acted on in the same manner proposed by applicant.

Further, applicant has also argued that applicant's invention is distinct because Arenson does not describe that the heating and cooling of the fuel and air provides a combustion efficiency improvement (see response, p. 17). However, the examiner notes that Arenson clearly does provide that some combustion benefit occurs as a result of the process (see Arenson, at least col. 3, lines 66 through col. 4, line 3). Further, even if not combustion efficiency improvement were described, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See Ex parte Obiaya, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Accordingly, Applicant's claims are not considered to patentably distinguish applicant's invention over the prior art.

**Regarding application's submission of the account of correspondence from CGRI Research Institute.**

Applicant again submits the account of correspondence from CGRI Research Institute purportedly as evidence of the level of ordinary skill in art and/or as evidence to overcome

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evidence of obviousness. However, this report is submitted merely in the form of arguments made by applicant and not in the form of a declaration or affidavit under 37 CFR 1.132.

Objective evidence must be supported by an appropriate declaration or affidavit to be of probative value. See MPEP 716.01(I), (II), and (III).

Though applicant appears to argue that the correspondence is submitted under 37 CFR 1.132 as a declaration (see page 39 of the 7/10/06 response), the examiner notes that the correspondence does not conform to the requirements of 37 CFR 1.68.

Accordingly, this account of the correspondence from CGRI is not considered persuasive in overcoming the rejections based on the prior art.

### ***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

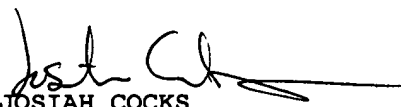
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11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Josiah Cocks whose telephone number is (571) 272-4874. The examiner can normally be reached on M-F 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ehud Gartenberg can be reached on (571) 272-4828. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

jcc  
October 15, 2006

  
JOSIAH COCKS  
PRIMARY EXAMINER  
ART UNIT 3749